

AMENDMENTS TO THE CLAIMS:

Please amend claims 7 and 13 and add new claims 14-34 as set forth in the following listing of claims. This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) A display unit configured for use in a sign display panel comprising:
a central processing unit;
a display output device;
an interface for first receiving a plurality of frames, and second receiving a plurality of display instructions; and
memory for storing software configured for execution by the central processing unit, wherein the software comprises instructions for storing each of the plurality of frames and, upon receipt of each of the plurality of display instructions, processing one of the frames to update the display output device.
2. (Original) The display unit of claim 1 wherein each of the plurality of display instructions identifies the one frame for processing.
3. (Original) The display unit of claim 1 wherein the frames are processed in order the frames were received.
4. (Original) The display unit of claim 1 wherein the frames are stored in a first-in-first-out (FIFO) memory.

5. (Original) The display unit of claim 1 wherein processing one of the frames comprises sending instructions to a set of output drivers to update the output display device.

6. (Original) The display unit of claim 1 wherein the output display device comprises an LED display.

7. (Currently amended) A method of rapidly refreshing a sign display panel, the method comprising:

receiving, based on at least one [[of a]] first message, a plurality of frames;

storing each of the plurality of frames;

receiving, based on a second message, at least one of a plurality of display instructions; and

processing, upon receipt of the second message, one of the plurality of frames to update a display output device.

8. (Original) The method of claim 7 wherein each of the display instructions identify the one frame for processing.

9. (Original) The method of claim 7 wherein the frames are processed in order the frames were received.

10. (Original) The method of claim 7 wherein the frames are stored in a first-in-first-out (FIFO) memory.

11. (Original) The method of claim 7 wherein processing one of the frames comprises sending instructions to a set of output drivers to update the display output device.

12. (Original) The method of claim 7 wherein the output display device comprises an LED display.

13. (Currently Amended) A system for rapidly refreshing a sign display panel, the system comprising:

means for receiving, based on at least one [[of a]] first message, a plurality of frames;

means for storing each of the plurality of frames;

means for receiving, based on a second message, at least one of a plurality of display instructions; and

means for processing, upon receipt of the second message, one of the plurality of frames to update a display output device.

14. (New) A display unit configured for use in a sign display panel, the display unit comprising:

a memory;

a display output device;

an interface configured to communicate with a controller of the sign display; and

a central processing unit configured to:

receive, through the interface, one or more messages of a first type, the one or more messages of the first type communicating multiple frames of display data;

store a plurality of the received frames in the memory upon receipt;

receive, through the interface, a message of a second type containing a display instruction, the display instruction instructing the display unit to display one frame of the stored frames; and

process the one frame to update the display output device upon receipt of the display instruction.

15. (New) The display unit of claim 14, wherein the first message type is a local message containing an address for a particular display unit.

16. (New) The display unit of claim 15, wherein the interface is configured to connect the display unit between a controller and an other display unit in series, and wherein the display unit is configured to, upon receipt of a local message:

check the address; and

if the display unit is not the particular unit:

decrement the address; and

send the local message, with the decremented address, to the other display unit.

17. (New) The display unit of claim 14, wherein the second type of message is a global message.

18. (New) The display unit of claim 14, wherein the display unit is further configured to identify the one frame from among the stored frames based on the display instruction.

19. (New) The display unit of claim 18, wherein the display unit is further configured to identify the one frame based on a frame identifier contained in the display instruction.

20. (New) The display unit of claim 14, wherein the memory comprises a first-in-first-out memory and, upon receipt of the display instruction, the display unit is further configured to display the next frame stored in the memory.

21. (New) A method of rapidly refreshing a sign display panel, the sign display panel comprising: a controller; a plurality of display units, each display unit respectively comprising a display output device and a memory; and an interface configured to communicate messages from the controller to the display units, the method comprising:

the controller sending multiple frames of display data to the display units through the interface, the frames being contained in one or more messages of a first type;

the display units respectively receiving and storing a plurality of the frames in memory upon receipt;

the controller sending a display instruction to the display units through the interface, the display instruction instructing the display units to display one frame of the stored frames, the display instruction being contained in a message of a second type;

the display units respectively receiving the display instruction; and

the display units respectively processing the one frame to update the display output device upon receipt of the display instruction.

22. (New) The method of claim 21, wherein the first message type is a local message containing an address for a particular display unit.

23. (New) The method of claim 22, wherein the display units include a first display unit and a next display unit connected in series and wherein, upon receipt of a local message, the first display unit:

checks the address; and

if the first display unit is not the particular unit:

decrements the address; and

sends the local message, with the decremented address, to the next display unit.

24. (New) The method of claim 21, wherein the second type of message is a global message.

25. (New) The method of claim 21, wherein the display instruction identifies the one frame from among the stored frames.

26. (New) The method of claim 25, wherein each frame comprises a frame identifier, and the display instruction identifies the one frame by the frame identifier.

27. (New) The method of claim 21, wherein the memory comprises a first-in-first-out memory and, upon receipt of the display instruction, the display units display the next frame stored in the memory of the respective display unit.

28. (New) A system for rapidly refreshing a sign display panel, the system comprising:

a sign display panel comprising:

a controller;

a plurality of display units, each display unit respectively comprising a display output device and a memory; and

an interface configured to communicate messages from the controller to the display units;

wherein, the controller is configured to:

send multiple frames of display data to the display units through the interface, the frames being contained in one or more messages of a first type; and

send a display instruction to the display units through the interface, the display instruction instructing the display units to display one frame of the stored frames, the display instruction being contained in a message of a second type; and

each display unit is respectively configured to:

store a plurality of the frames in memory upon receipt;

receive the display instruction; and

process the one frame to update the display output device upon receipt of the display instruction.

29. (New) The system of claim 28, wherein the first message type is a local message containing an address for a particular display unit.

30. (New) The system of claim 29, wherein the display units include a first display unit and a next display unit connected in series and wherein the first display unit is configured to, upon receipt of a local message:

check the address; and

if the first display unit is not the particular unit:

decrement the address; and

send the local message, with the decremented address, to the next display unit.

31. (New) The system of claim 28, wherein the second type of message is a global message.

32. (New) The system of claim 28, wherein the display instruction identifies the one frame from among the stored frames.

33. (New) The system of claim 32, wherein each frame comprises a frame identifier, and the display instruction identifies the one frame by the frame identifier.

34. (New) The system of claim 28, wherein the memory comprises a first-in-first-out memory and, upon receipt of the display instruction, the display units display the next frame stored in the memory of the respective display unit.